

Where:

A = hydrocarbon concentration (ppmC) of the span gas used in paragraph (d)(2) of this section.

B = hydrocarbon concentration (ppmC) of the oxygen interference check gases used in paragraph (d)(4) of this section.

(7) The percent of oxygen interference (designated as percent O₂I) must be less than \pm three percent for all required oxygen interference check gases prior to testing.

(8) If the oxygen interference is greater than the specifications, incrementally adjust the air flow above and below the manufacturer's specifications, repeating paragraphs (d)(1) through (d)(7) of this section for each flow.

(9) If the oxygen interference is greater than the specification after adjusting the air flow, vary the fuel flow and thereafter the sample flow, repeating paragraphs (d)(1) through (d)(7) of this section for each new setting.

(10) If the oxygen interference is still greater than the specifications, repair or replace the analyzer, FID fuel, or burner air prior to testing. Repeat this section with the repaired or replaced equipment or gases.

§ 90.317 Carbon monoxide analyzer calibration.

(a) Calibrate the NDIR carbon monoxide analyzer as described in this section.

(b) *Initial and periodic interference.* Prior to its initial use and annually

thereafter, check the NDIR carbon monoxide analyzer for response to water vapor and CO₂:

(1) Follow good engineering practices for instrument start-up and operation. Adjust the analyzer to optimize performance on the most sensitive range to be used.

(2) Zero the carbon monoxide analyzer with either purified synthetic air or zero-grade nitrogen.

(3) Bubble a mixture of three percent CO₂ in N₂ through water at room temperature and record analyzer response.

(4) An analyzer response of more than one percent of full scale for ranges above 300 ppm full scale or more than three ppm on ranges below 300 ppm full scale requires corrective action. (Use of conditioning columns is one form of corrective action which may be taken.)

(c) *Initial and periodic calibration.* Prior to its initial use and monthly thereafter, or within one month prior to the certification test, calibrate the NDIR carbon monoxide analyzer.

(1) Adjust the analyzer to optimize performance.

(2) Zero the carbon monoxide analyzer with either purified synthetic air or zero-grade nitrogen.

(3) Calibrate on each used operating range with carbon monoxide-in-N₂ calibration gases having nominal concentrations between 10 and 90 percent of that range. A minimum of six evenly spaced points covering at least 80 percent of the 10 to 90 range (64 percent) is required (see following table).

Example calibration points (%)	Acceptable for calibration?
20, 30, 40, 50, 60, 70	No, range covered is 50 percent, not 64.
20, 30, 40, 50, 60, 70, 80, 90	Yes.
10, 25, 40, 55, 70, 85	Yes.
10, 30, 50, 70, 90	No, though equally spaced and entire range covered, a minimum of six points are needed.

Additional calibration points may be generated. For each range calibrated, if the deviation from a least-squares best-fit straight line is two percent or less of the value at each data point, calculate concentration values by use of a single calibration factor for that range. If the deviation exceeds two percent at any point, use the best-fit non-linear equation which represents the data to

within two percent of each test point to determine concentration.

§ 90.318 Oxides of nitrogen analyzer calibration.

(a) Calibrate the chemiluminescent oxides of nitrogen analyzer as described in this section.

(b) *Initial and Periodic Interference:* Prior to its initial use and monthly